Controlled Breathing With or Without Peppermint Aromatherapy for Postoperative Nausea and/or Vomiting Symptom Relief: A Randomized Controlled Trial

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INTRODUCTION

Postoperative nausea and/or vomiting (PONV) is one of the most common fears patients report when facing surgery. It has been shown to be a major indicator of extended postoperative stays and unplanned admissions, which cost several millions of dollars annually.

So many times, healthcare providers turn first to medications when patients complain of nausea and vomiting. There are potentially adverse drug reactions associated with antiemetics, such as sedation, decreased respiratory status and EKG changes[1]. Also, the cost of medications directly impacts not just patients, but the healthcare industry as a whole.

Although aromatherapy is one of the lesser known alternative therapies in the US, it is commonly used in the nursing care of patients in the UK, Canada and Australia[2]. The American Society of PeriAnesthesia Nurses (ASPAN) Evidence-Based Clinical Practice Guideline for the Prevention and/or Management of PONV and Post Discharge Nausea and Vomiting (PDNV) in Adult Patients[3] recommends implementation of rescue interventions to include aromatherapy during both Phase I and Phase II postanesthesia care.

Perioperative day surgery nurses at this not-for-profit, Magnet community hospital decided to rigorously evaluate their practice of using peppermint aromatherapy for the treatment of PONV. They recognized a need for a multidisciplinary approach and recruited CRNAs and PACU nurses to the research team.

PURPOSE: This study was designed to evaluate controlled breathing alone (CB) verses controlled breathing with peppermint aromatherapy (AR) for the relief of PONV in patients receiving general anesthesia for elective outpatient procedures.

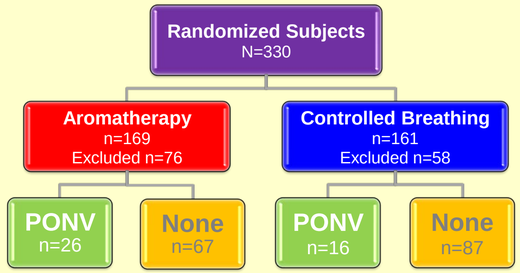
METHODS

- Study Design: IRB-approved, single blinded, randomized control trial
- Inclusion Criteria
  - Males and females ≥18 years
  - Able to breath through their nose
  - Capable of verbalizing PONV symptoms
  - Outpatient laparoscopic, ENT, orthopedic or urological procedures
  - General anesthesia intubation with ASA score of I or II
- Exclusion Criteria
  - Nausea and/or vomiting within 24 hours of admission
  - History of alcoholism
  - Allergy to menthol or peppermint
  - Weekend or emergent surgeries
  - Pregnant women, department of correction clients, patients taking disulfiram (Antabuse) or metronidazole (Flagyl)
- Data Collection and Analysis
  - Nausea and/or vomiting symptoms via 0-10 descriptive ordinal scale (DOS), age, gender, PONV risk factors, hours NPO
  - Significance established at $p \leq .05$ for all inferential statistical tests

INTERVENTION PROTOCOL

- Single episode of PONV evaluated in PACU or Post-Op Day Surgery
- Upon initial complaint of PONV, subjects:
  - Instructed to inhale deeply through nose to count of 3
  - Hold breath to count of 3
  - Exhale to count of 3
  - Complete 3 cycles = 1 treatment
    - AR: vial with peppermint extract (500 µl) placed under nose
    - CB: sham vial placed under nose
- 5 minutes after initial treatment
  - Symptoms re-evaluated
  - Second treatment given if PONV unresolved
- 10 minutes after initial complaint
  - Symptoms re-evaluated
  - Subjects with unresolved PONV offered rescue antiemetic

STUDY POPULATION DISTRIBUTION



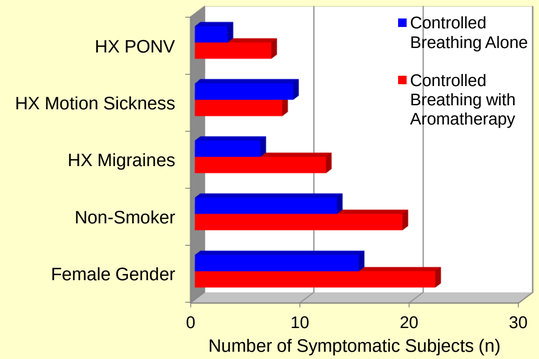
- Incidence of PONV among eligible subjects (21.4%) was limited
  - 15.5% (16/103) of CB subjects
  - 28% (26/93) of AR subjects

DEMOGRAPHICS of SYMPTOMATIC SUBJECTS

Characteristic	Controlled Breathing Alone n=16	Controlled Breathing w/ Aromatherapy n=26	Statistic	*p* Value
Gender (n)			X^2=.788	.375
Female	15	22		
Male	1	4		
Age (yr)			*t*=.398	.694
Mean ±SD	45.7±17.1	47.8 ±15.3		
Range	22 – 82	20 - 90		

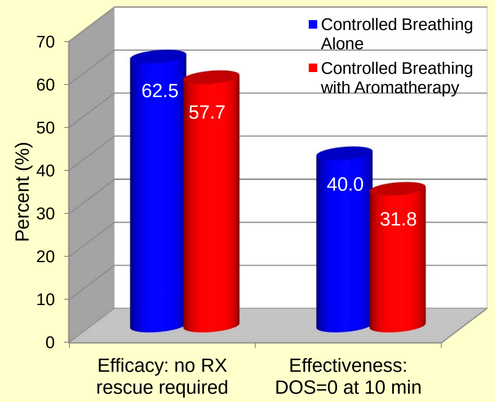
- Demographics of subjects experiencing PONV did not differ significantly between control and experimental groups
  - Gender evaluated by chi-squared test of a contingency table
  - Age evaluated by two-tailed Student's *t* Test

PONV RISK FACTOR FREQUENCY



- No significant difference (F=1.047; p=.405) in common PONV risk factors was observed between CB and AR symptomatic subjects as determined by multivariable regression analysis
- However, among all study subjects (N=196), female gender was a significant risk factor for PONV incidence (p=.002)
- PONV experienced by subjects with two, three, four and five risk factors was 14%, 32%, 54% and 83%, respectively

EFFECTIVENESS & EFFICACY



- PONV symptoms assessed by self-reported DOS with 0 being none and10 being the worst symptoms a subject could imagine
- Although CB was more efficacious and more effective than AR, these differences were not significant
  - Efficacy: X^2=.09; p=.76
  - Effectiveness: X^2=.26; p=.61

SUMMARY

CONCLUSIONS

- Lower than expected PONV likely due to inclusion of subjects regardless of risk factor status undergoing a wide variety of outpatient surgeries
- Among symptomatic subjects, the control and experimental groups were similar with respect to gender, age and presence of risk factors
- Controlled breathing alone was more efficacious and effective in relieving PONV symptoms than peppermint aromatherapy with controlled breathing – but the difference was not statistically significant
- An intervention that approaches 60% efficacy, as observed with aromatherapy lends credibility to its usefulness

STUDY LIMITATIONS

- Low incidence of PONV among subjects
- Substantial subject attrition due to: unplanned hospital admission, postoperative instability, study CRNA unavailability, protocol deviation, ASA score and subject choice

STUDY STRENGTHS

- Study design utilized controlled breathing with all PONV subjects in contrast to the majority of previously published aromatherapy research
- Controlling aromatherapy dosage with a metered volume of peppermint spirits stands in contrast to studies that have not precisely calculated the amount of aromatherapy administered to subjects

IMPLICATIONS

- Controlled breathing is an immediate, cost-free, alternative intervention to prescribed medications for the treatment of PONV
- Subjects' comments revealed satisfaction with the peppermint aromatherapy and indicated it would be beneficial to have it available throughout their recovery, in the event of recurrent episodes

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3. American Society of PeriAnesthesia Nurses. In: *PeriAnesthesia Nursing Standards of Practice Recommendations 2010-2012*. Cherry Hill, NJ: ASPAN; 2010:46-54.

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